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Foxlin et al.

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(54) **MOTION-TRACKING**

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33/333, 355 R

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(57) **ABSTRACT**

Inertial trackers have been successfully applied to a wide range of head mounted display (HMD) applications including virtual environment training, VR gaming and even fixed-base vehicle simulation, in which they have gained widespread acceptance due to their superior resolution and low latency. Until now, inertial trackers have not been used in applications which require tracking motion relative to a moving platform, such as motion-base simulators, virtual environment trainers deployed on board ships, and live vehicular applications including helmet-mounted cueing systems and enhanced vision or situational awareness displays. to the invention enables the use of inertial head-tracking systems on-board moving platforms by computing the motion of a "tracking" Inertial Measurement Unit (IMU) mounted on the HMD relative to a "reference" IMU rigidly attached to the moving platform.

42 Claims, 7 Drawing Sheets

